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Expanding Deployment Modeling into DPO (Distribution Process Owner) Modeling

Dr. Chuck Van Groningen, Argonne National Laboratory

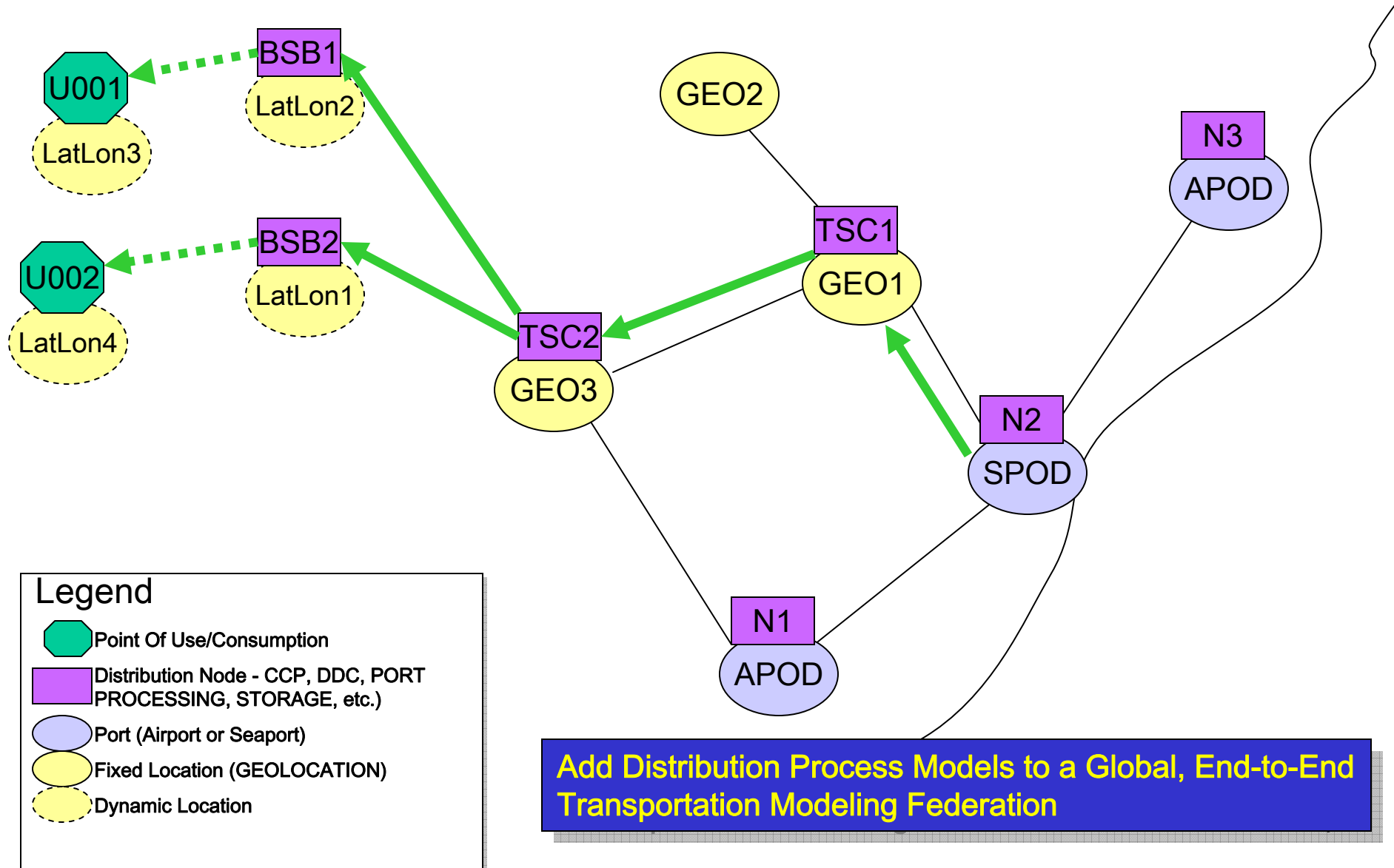
Dr. Soraya Stevens, BBN Technologies



Presentation Overview

- Modeling in the Analysis of Mobility Platform (AMP) Environment
- Tour of Present and Future Capabilities
- Expansion of Capabilities to Support DPO Modeling
- Summary/Q&A

Where are we going in ETED?

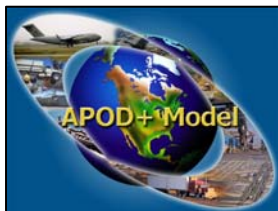


AMP Overview

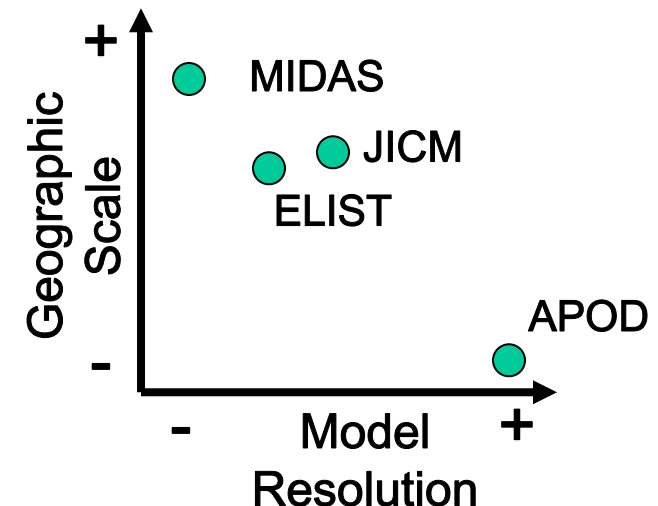


AMP is an Integrated Federation of Modeling and Simulation Tools that...

MIDAS



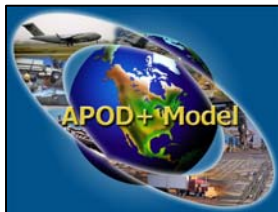
- Enables collaborative Programmatic Analysis across the DoD
- Is a Federation of Models in a single application
- Merges GOTS and COTS tools in a common Open platform
- Answers infrastructure, process, systems, policy, and lift capability analysis questions
- Provides analytical comparisons air-sea tradeoff analysis
- Is expanding to include distribution concepts through the E2E Distribution Modeling R&D effort



AMP Overview

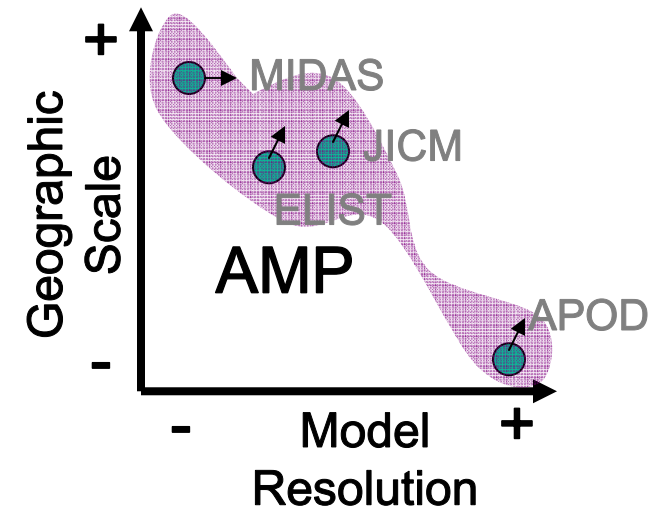


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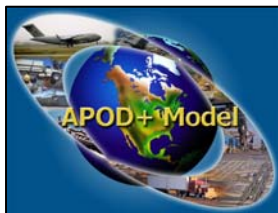
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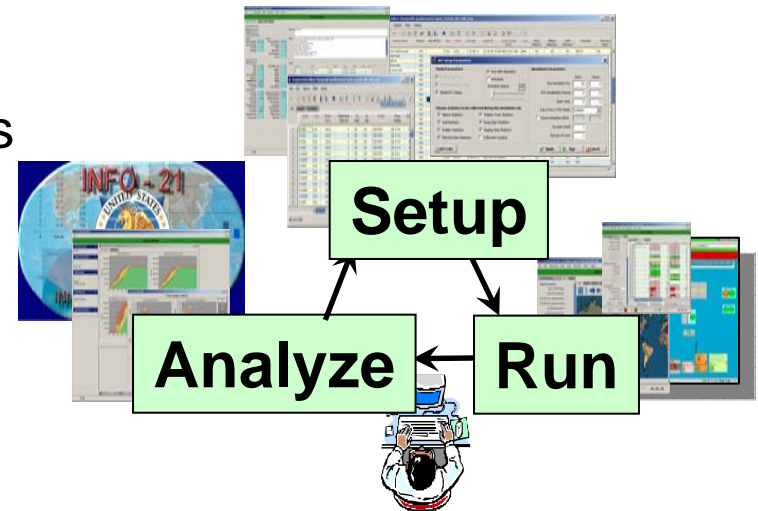


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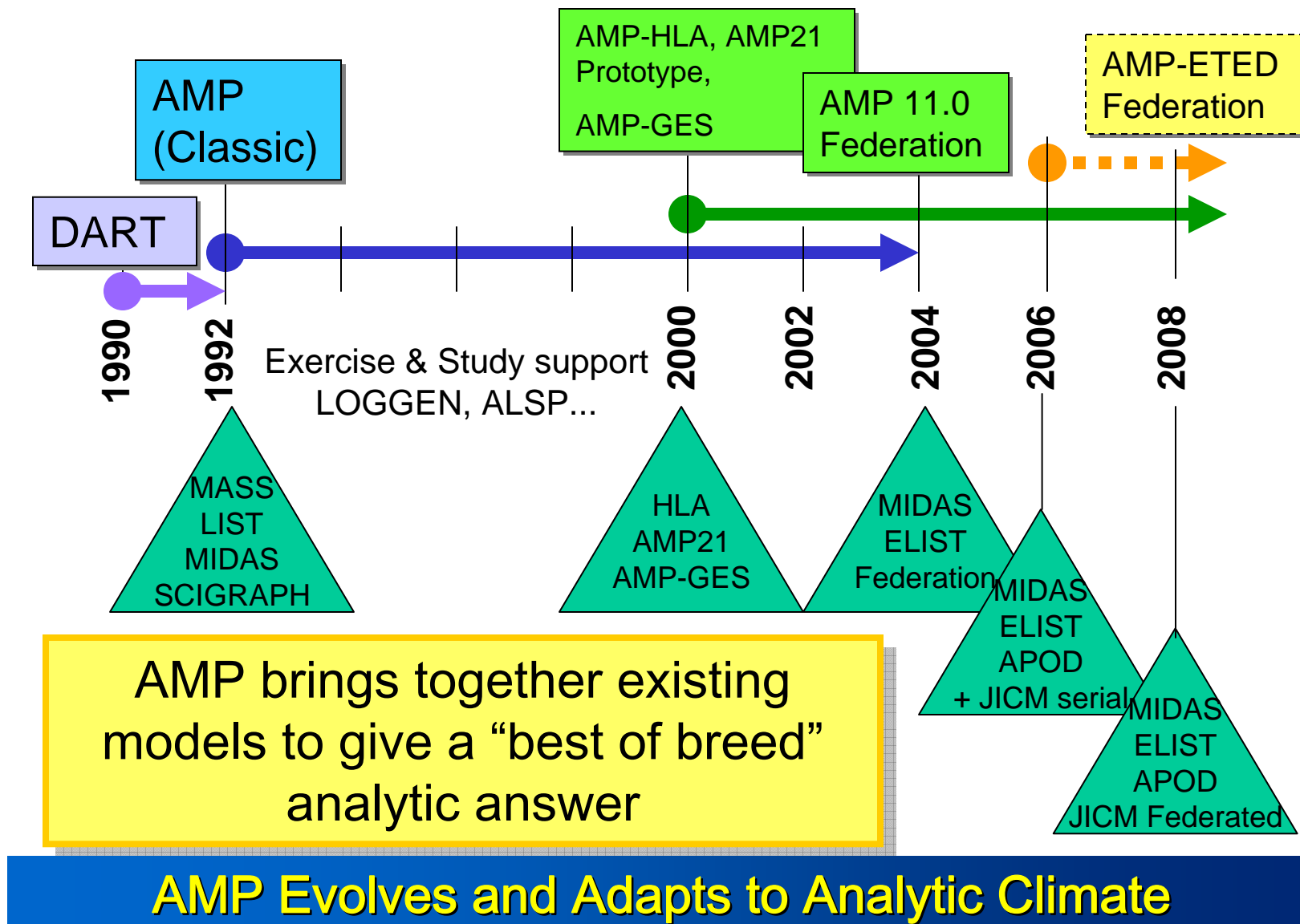


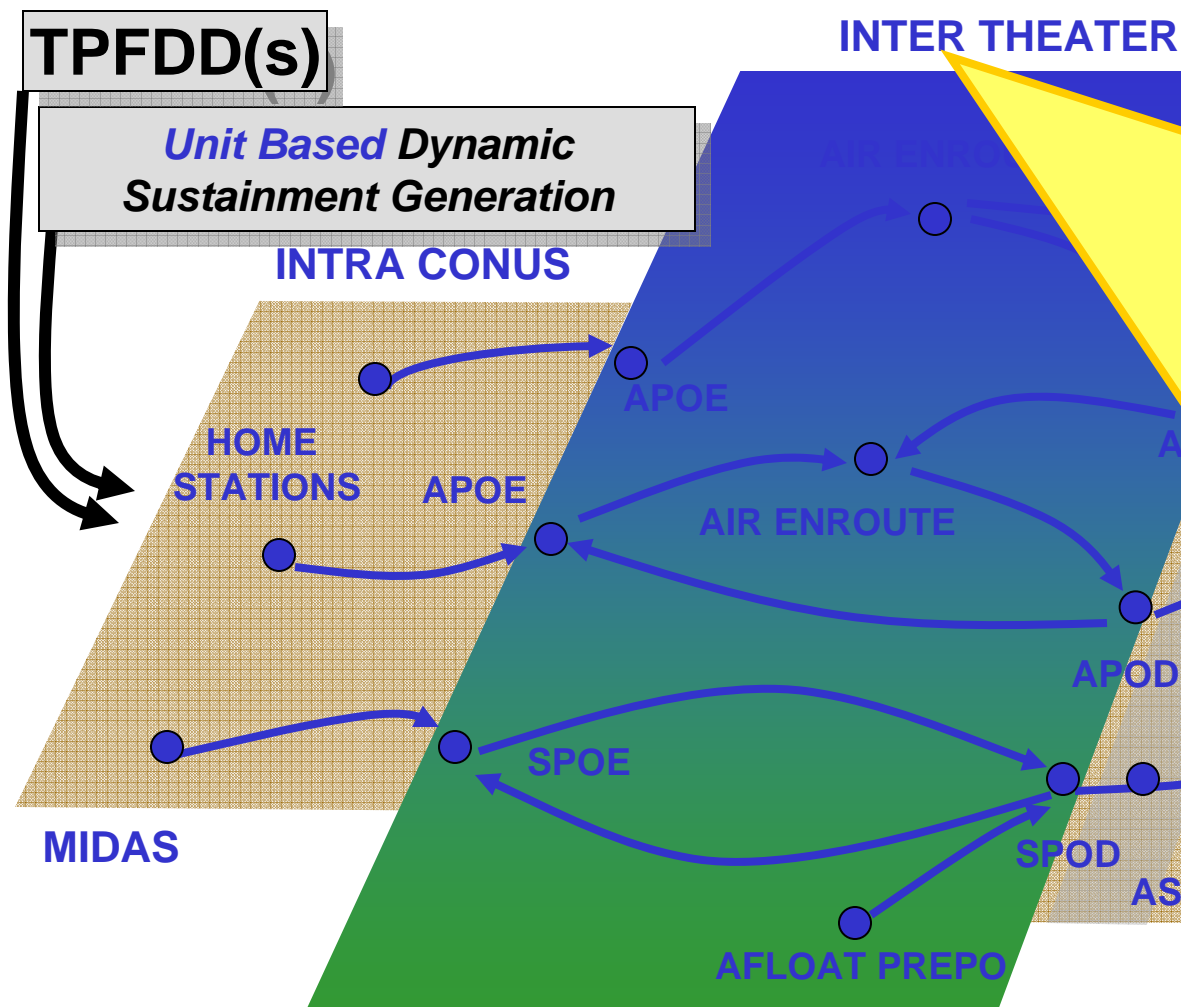
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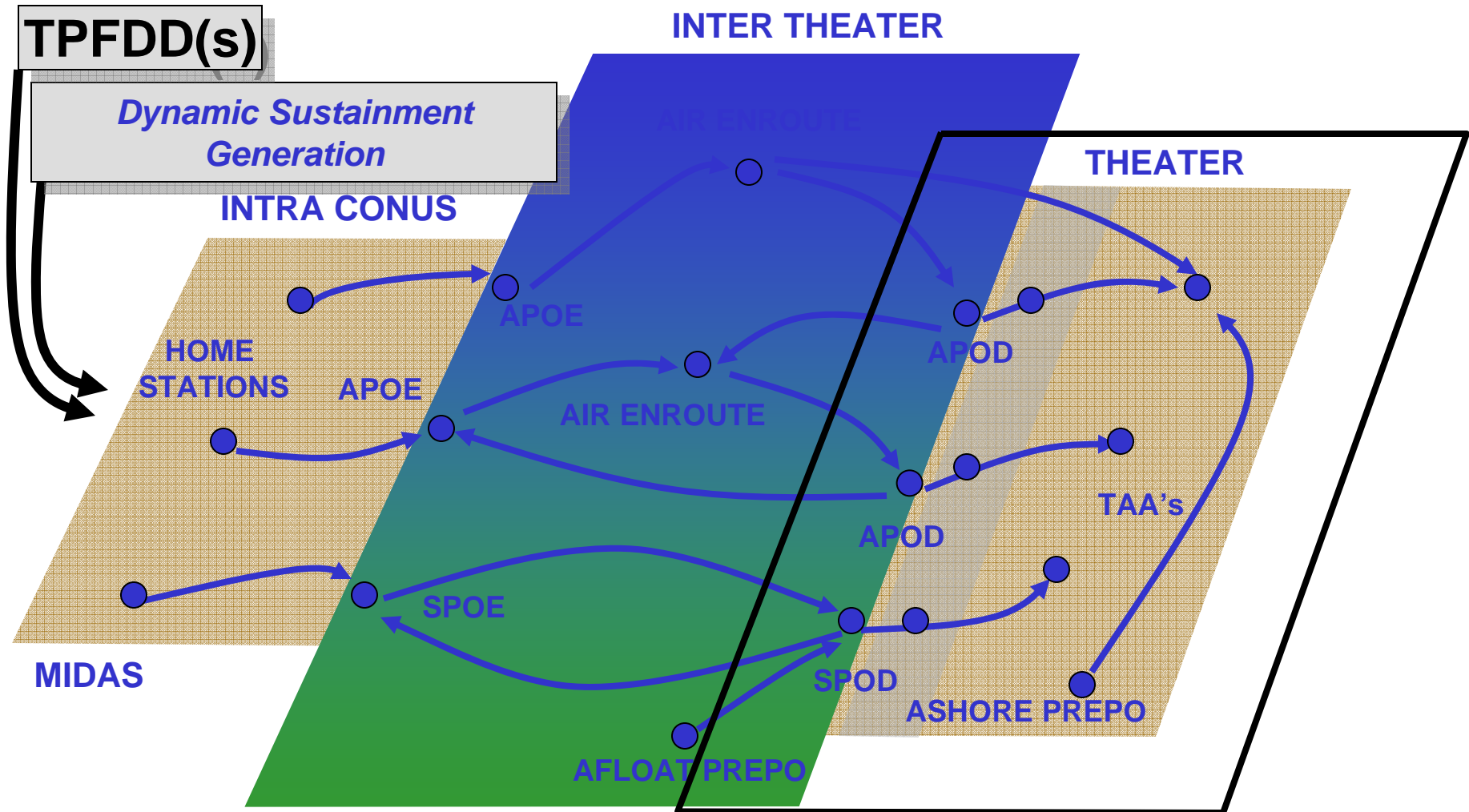
The Evolution of AMP to ETED



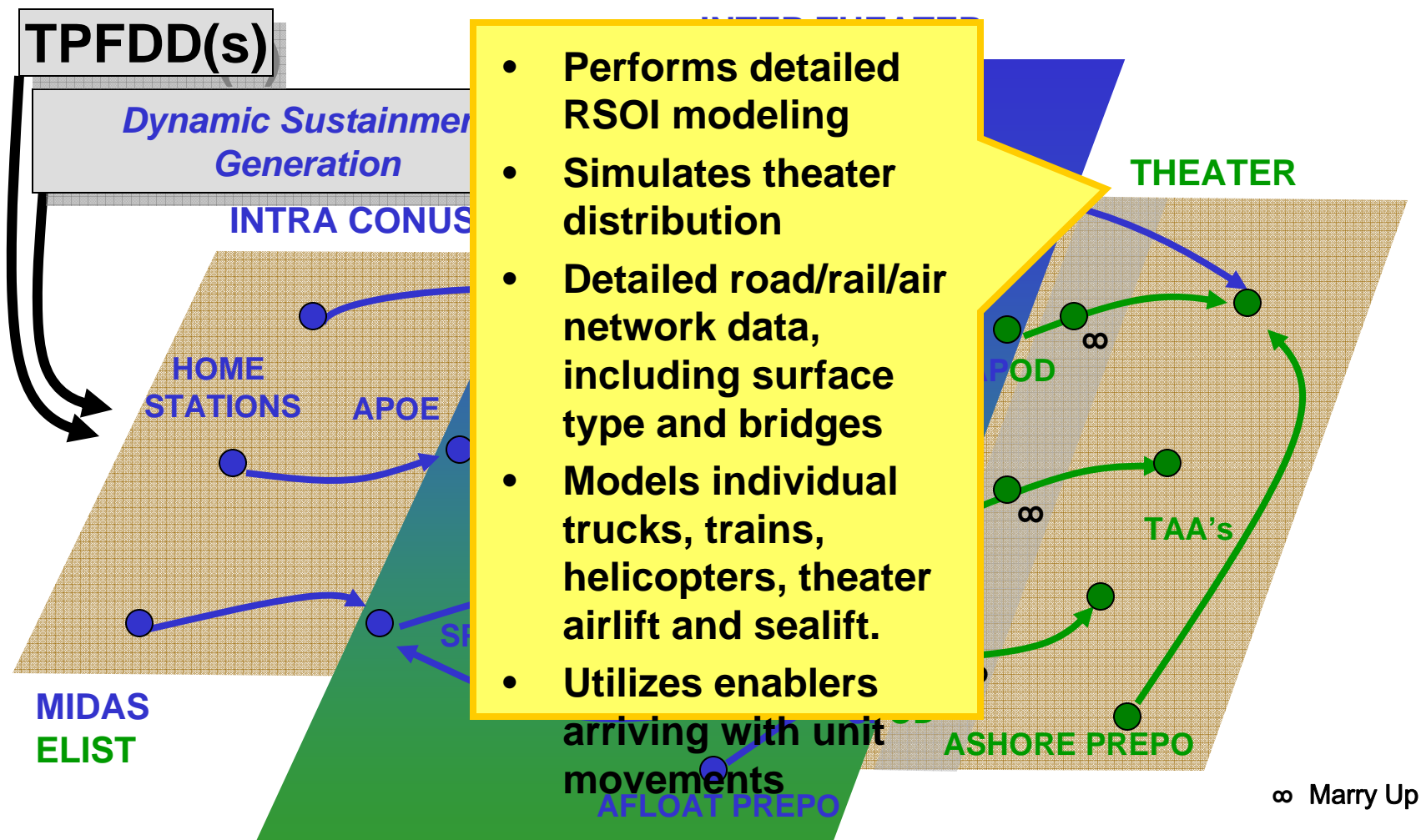


- Dynamic Mode and Port Selection Feature
- Linked Airlift and Sealift Scheduler
- Dynamic Sustainment Generation modeled at CCC
- Inventory Management
- Strategic Airlift and Sealift Simulations with exogenous and stochastic events
- Multi-Theater
- Intermodal Transload
- Channel/SAAM missions
- Sealift PAX ferries
- Aircraft diversions
- Aircraft slotting
- Working/parking MOG and Hot cargo

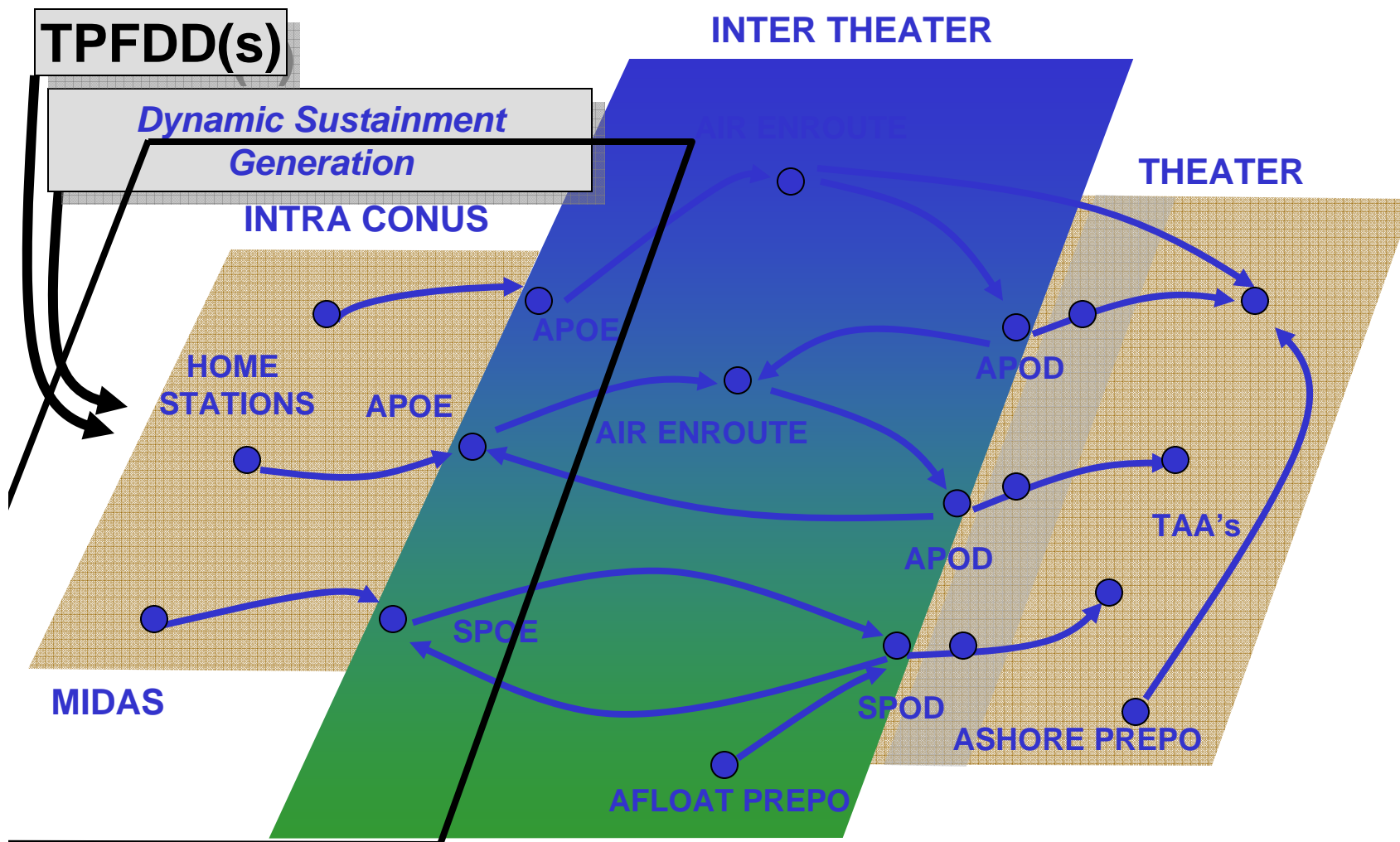
MIDAS: Detailed Strategic Airlift and Sealift



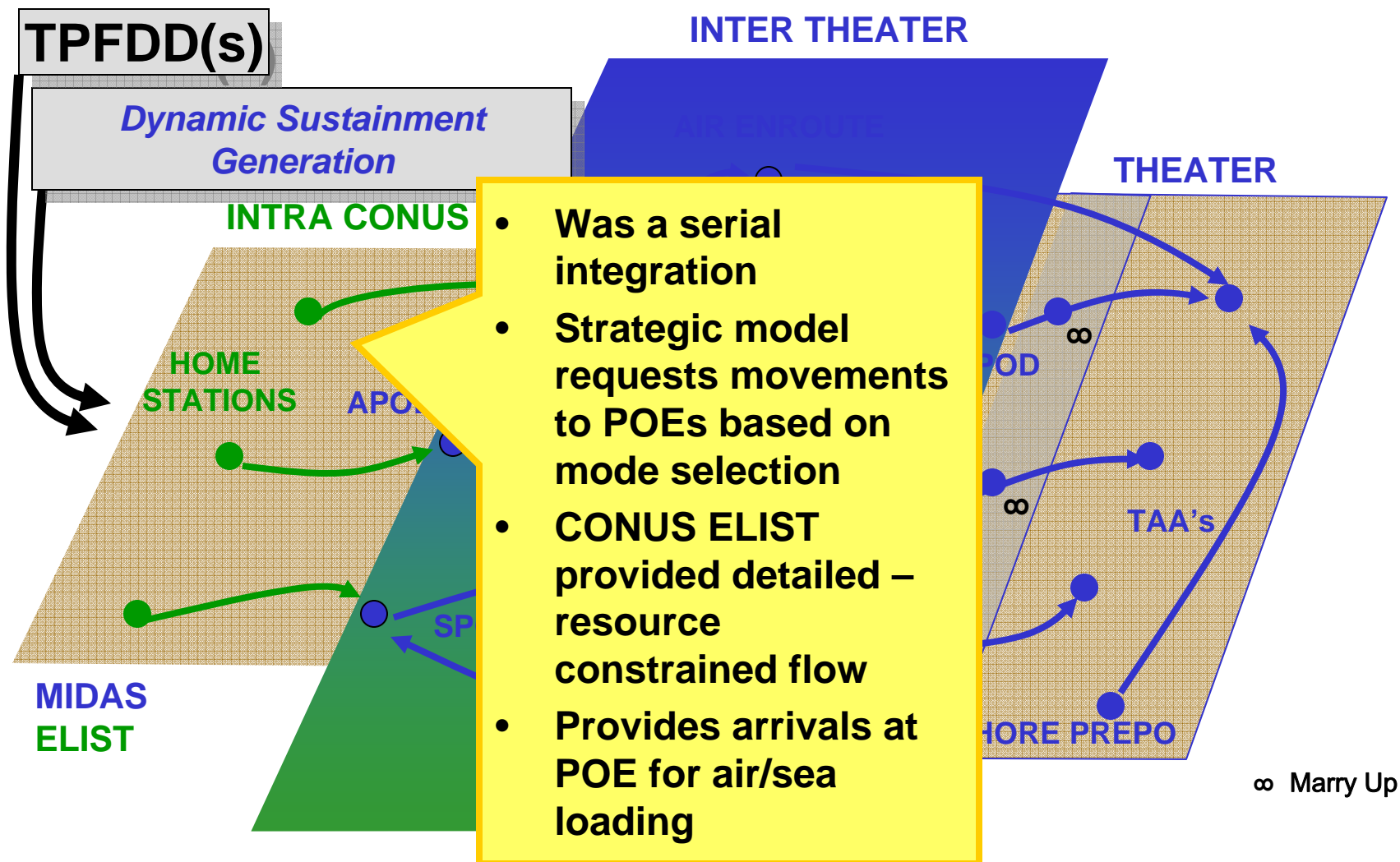
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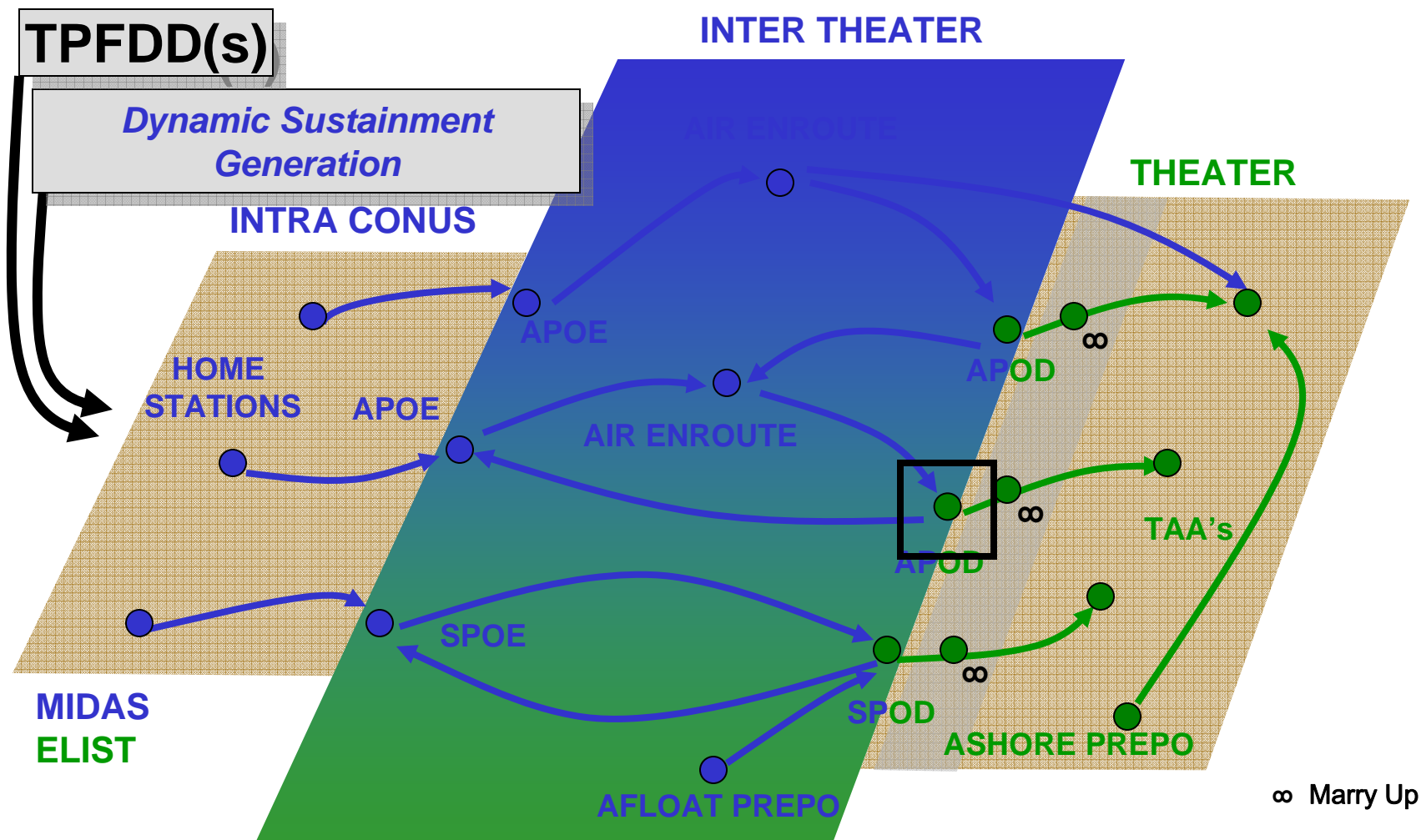
ELIST: Detailed Theater Distribution Modeling



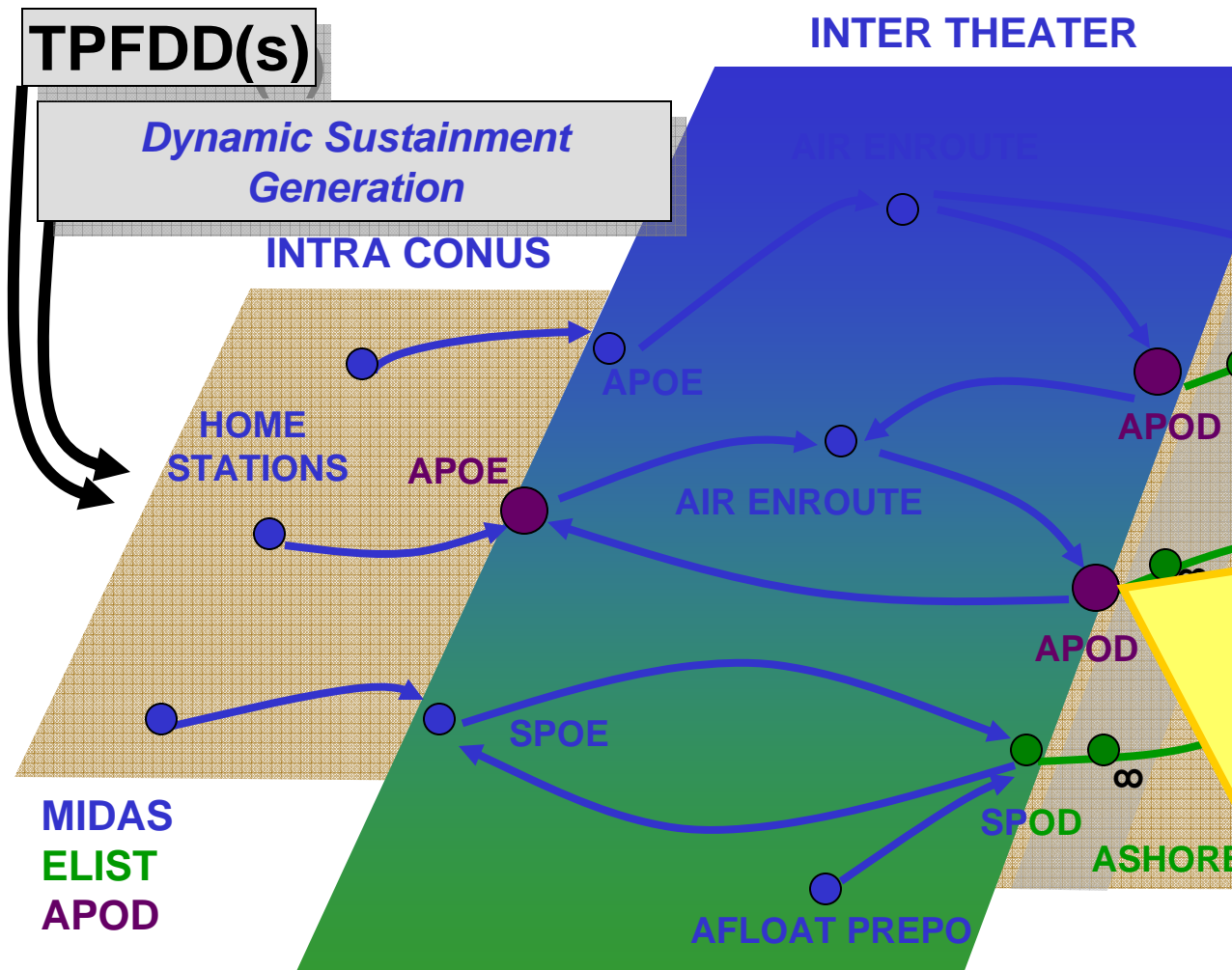
MIDAS: Detailed Strategic Airlift and Sealift



ELIST: Detailed CONUS Distribution Modeling



ELIST: Detailed Theater Distribution Modeling

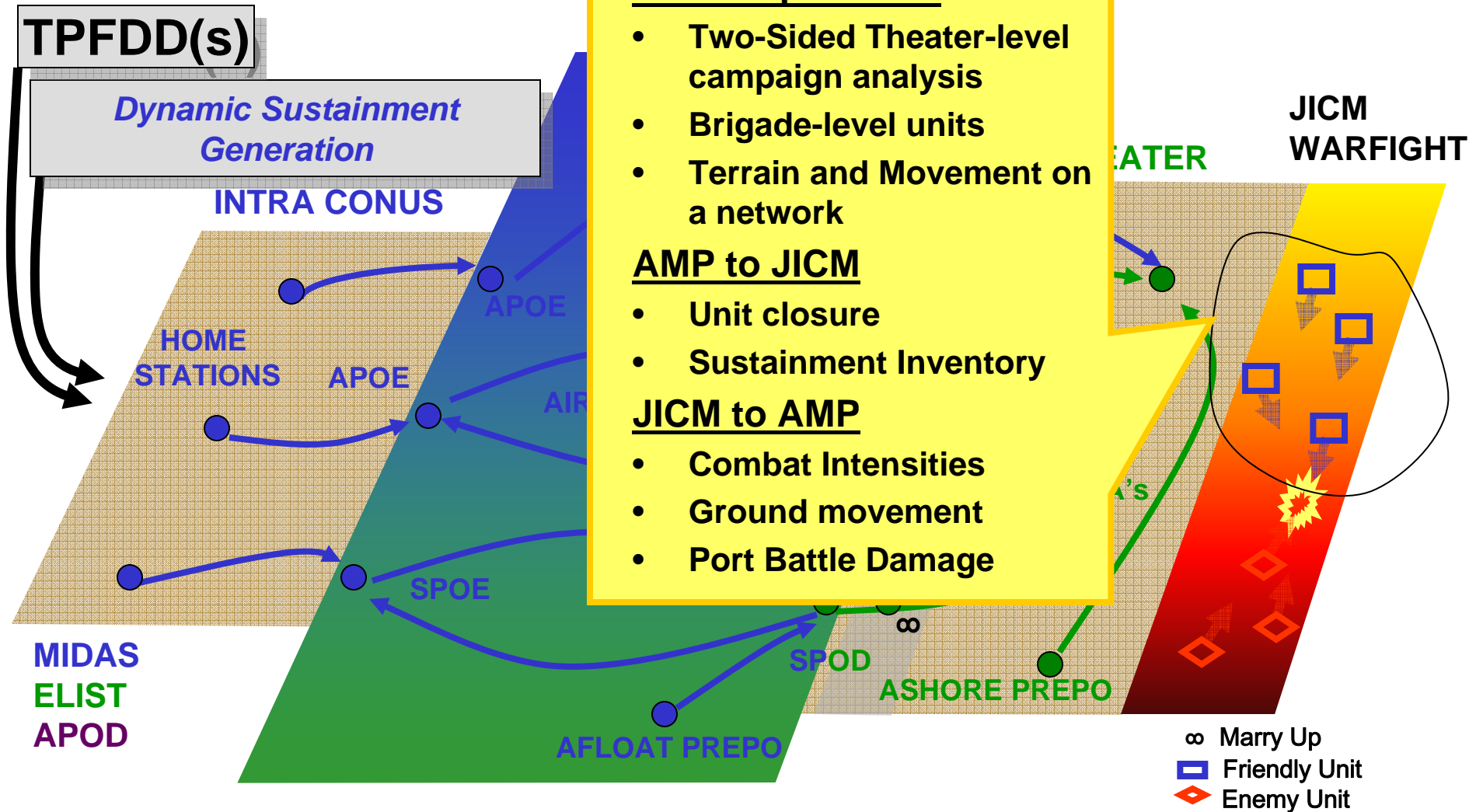


QuickLook Tools

- Identify Limiting Factors for Airport Throughput
- TPFDD Requirements vs. Capabilities analysis

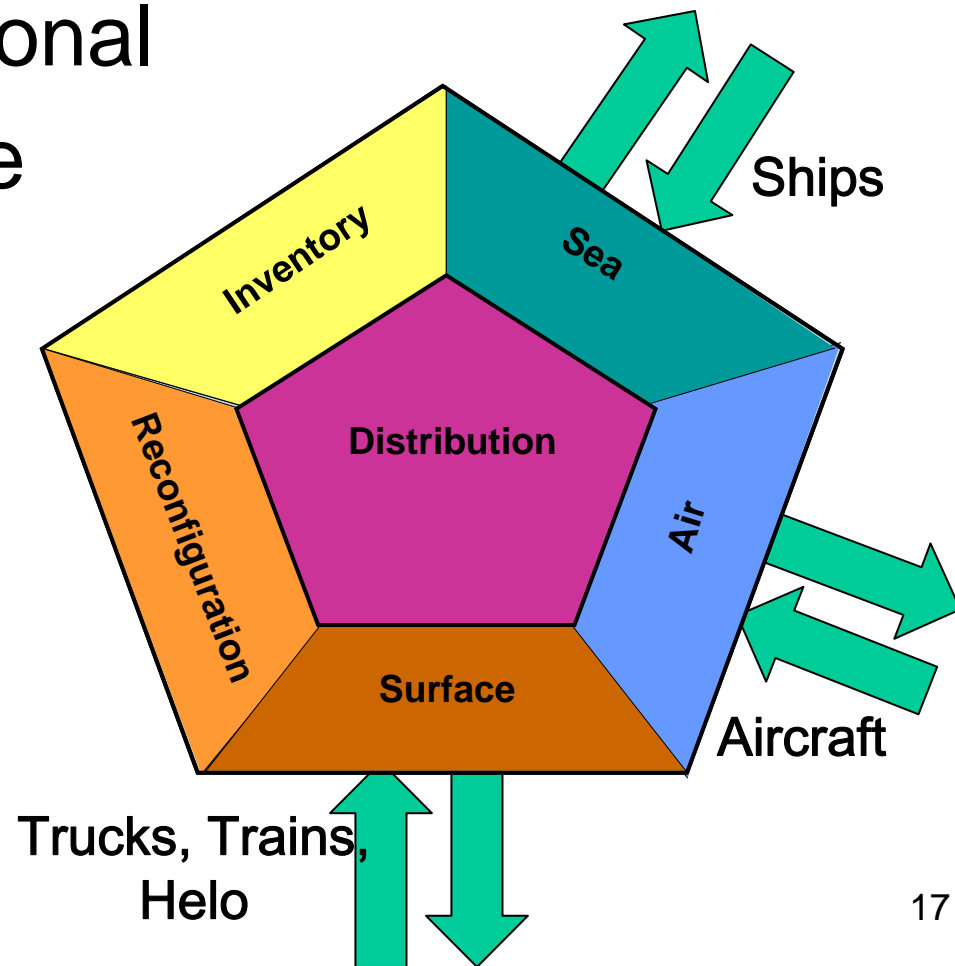
Detailed Simulation

- Refueling: hydrants, pipelines, fuel stands, and fuel storage
- Resource Modeling: Maintenance, Material Handling Equipment (MHE) and Personnel
- Cargo: onload/offload, cargo holds, staging areas
- Utilizes enablers arriving with unit movements
- Handoff to theater air and surface transportation

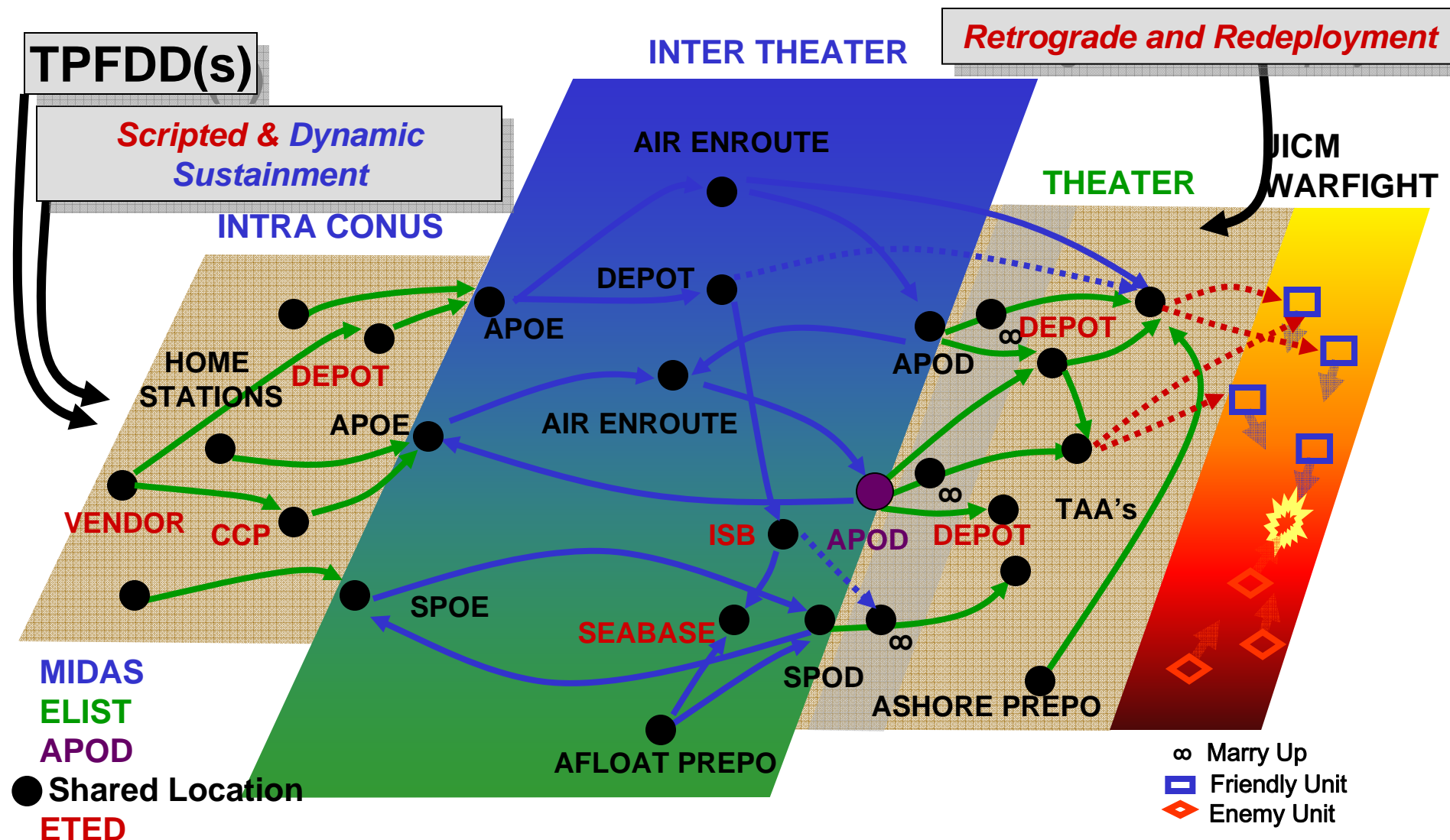


Dynamic Feedback from the JICM Warfight Model

- Node comprised of various functions
- Each part is optional
- Each part can be at various levels of aggregation

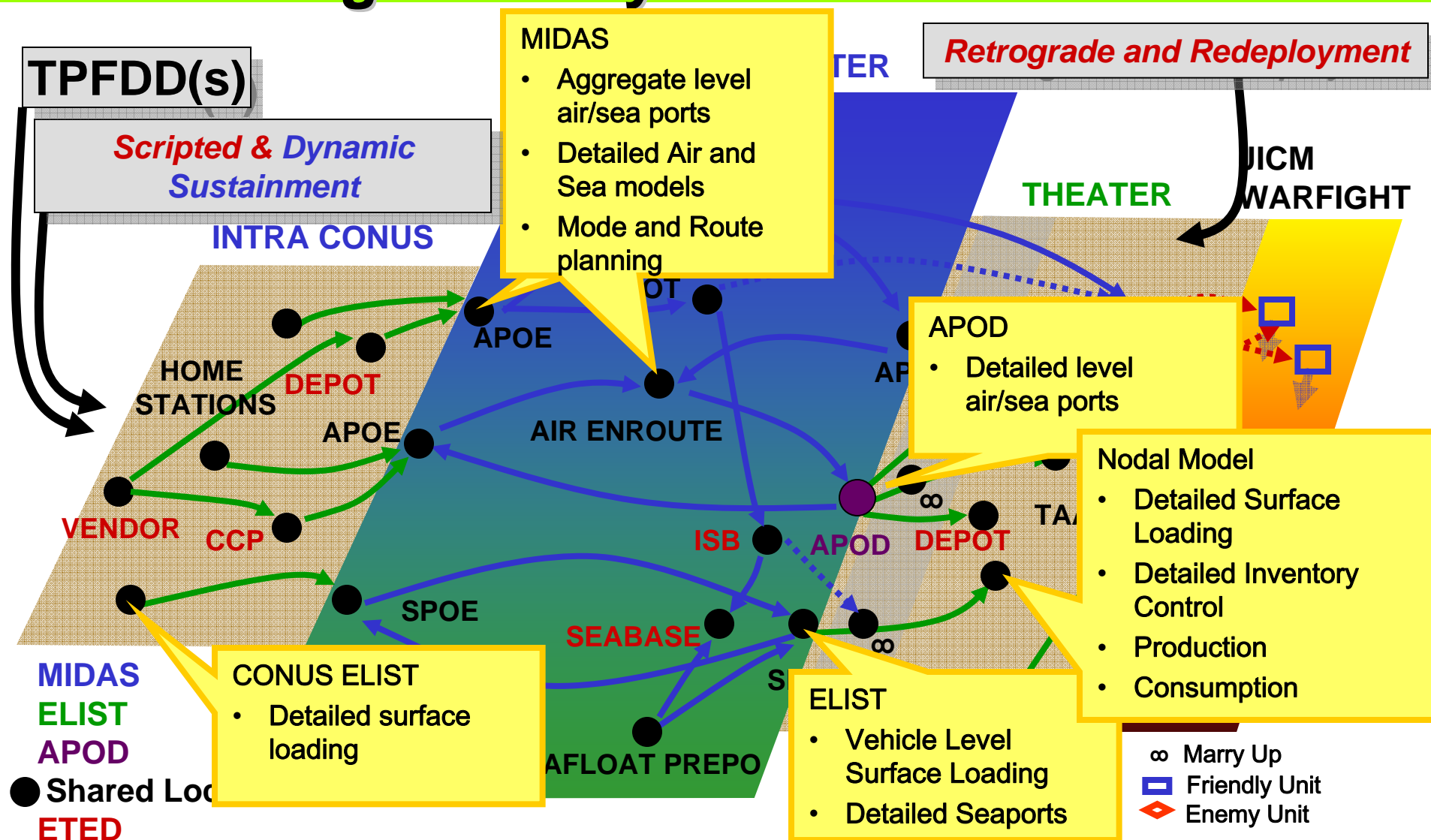


End-to-End Distribution Functionality 2007-2008



ETED Federation: Models Distribution Concepts

End-to-End Distribution Plug and Play – Levels of Detail



ETED Federation: Model Granularity

Deployment

Transportation

Distribution

- Expanding the Modeling Fidelity in Three areas to include DPO Concepts
- Expand the modularity of the Composite Federated Model to accommodate new process-focused models

Deployment

Transportation

Distribution

- TPFDD-based deployment
 - Use of Multiple-TUCHA's to specify configuration alternatives for Air and Sea
 - Basic load on organic vehicles
 - Loaded containers (sea) and pallets (air)
 - Extended movement schedule beyond TPFDD Destination (RSOI)
- Non-Unit cargo requirements
- Simulate movement at Level 4

Deployment

Transportation

Distribution

- Configuration Effects:
 - Surface loads are restricted by cargo dimensionality
 - Loading of airlift and sealift to include dimensionality constraints
- Platform modeling
 - E.g. pallet, container, JMIC, JMIP
 - Limited availability and retrograde flow

Deployment

Transportation

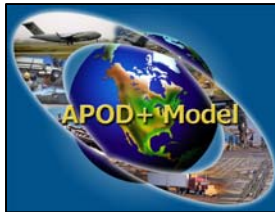
Distribution

- Unit-based Multi-Echelon Sustainment
 - Production and Consumption are modeled at the units
 - Units are not stationary during the run
- Resupply Configuration
 - Configurations defined for transportation
 - Re-configuration constraints modeled at nodes
- Inventory Management
- Stochastic Sourcing

Summary



MIDAS



- AMP Integrated Analysis Environment
 - Used by:
 - USTRANSCOM J5/4, JDPAC
 - SDDC-TEA
 - OSD
 - Joint Staff J4, J8
 - CAA
- E2E Distribution Modeling R&D Effort is expanding the modeling scope to DPO
 - Agile development
 - Modular and plug-and-play architecture for the Editing, Modeling, and Analysis tools.
 - E2E Distribution Model will be ready to adapt to future JDDE M&S needs.

Designed for Productivity, Flexibility, and Scalability